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# RESEARCH MEMORANDUM

EVALUATION OF GUST AND DRAFT VELOCITIES FROM FLIGHTS OF

P-61C AIRPLANES WITHIN THUNDERSTORMS JULY 12, 1947

TO JULY 18, 1947 AT CLINTON COUNTY

ARMY AIR FIELD, OHIO

By  
Jack Funk

Langley Memorial Aeronautical Laboratory  
Langley Field, Va.



**NATIONAL ADVISORY COMMITTEE  
FOR AERONAUTICS**

WASHINGTON

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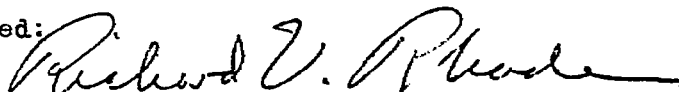
The results obtained from measurements of gust and draft velocities within thunderstorms at Clinton County Army Air Field, Ohio, for the period July 12, 1947 to July 18, 1947 are presented herein. These data are summarized in tables I and II, respectively, and are of the type presented in reference 1 for previous flights.

Langley Memorial Aeronautical Laboratory  
National Advisory Committee for Aeronautics  
Langley Field, Va.



Jack Funk  
Aeronautical Engineer

Approved:



Richard V. Rhode  
Chief of Aircraft Loads Division

CGB

REFERENCE

1. Tolefson, H. B.: Evaluation of Gust and Draft Velocities from Flights of P-61C Airplanes within Thunderstorms May 13, 1947 to May 29, 1947 at Clinton County Army Air Field, Ohio. NACA RM No. L7J29, 1947.

TABLE I.- SUMMARY OF GUST MEASUREMENTS FROM FLIGHTS  
OF P-61C AIRPLANES WITHIN THUNDERSTORMS

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 12, 1947 - Flight 12					
Airplane 327 - Traverse 1 Length of traverse 387.6 sec, 126,316 ft					
0 - 110	25,000	----	----	---	0
<sup>a</sup> 110 - 120		9.3	----	---	1
<sup>b</sup> 120 - 130		----	-7.4	---	1
130 - 150		----	----	---	0
150 - 270	24,500	----	----	---	0
270 - 300	25,000	----	----	---	0
<sup>a</sup> 300 - 310		6.3	-3.3	---	2
310 - 320		4.8	-8.2	---	4
320 - 330	24,500	----	-8.7	---	1
330 - 340		5.5	----	---	2
340 - 350		13.5	-9.0	---	2
<sup>b</sup> 350 - 360		5.1	----	106	2
360 - 390	25,000	----	----	---	0
Airplane 327 - Traverse 2 Length of traverse 261.7 sec, 88,908 ft					
0 - 40	25,000	----	----	---	0
40 - 50	24,500	----	----	---	0
<sup>a</sup> 50 - 60		----	----	---	0
60 - 70	25,000	----	-4.0	---	1
70 - 80		----	-4.9	---	1
80 - 90		----	----	---	0
90 - 120	24,500	----	----	---	0
120 - 140	25,000	----	----	---	0
140 - 150	24,500	----	----	---	0

<sup>a</sup>Cloud entry.

<sup>b</sup>Cloud exit.



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
July 12, 1947 - Flight 12								
Airplane 327 - Traverse 2 Length of traverse 261.7 sec, 88,908 ft								
150 - 160	24,500	12.5	-----	9.8	-----	96	---	1
160 - 170		-----	-----	-----	-----	---	---	0
170 - 180		8.4	-----	21.3	-----	201	---	1
180 - 200		-----	-----	-----	-----	---	---	0
<sup>b</sup> 200 - 210		-----	-----	-----	-----	---	---	0
210 - 270		-----	-----	-----	-----	---	---	0
Airplane 327 - Traverse 3 Length of traverse 60.4 sec, 21,720 ft								
0 - 70	24,500	----	-----	----	-----	---	---	0
Airplane 353 - Traverse 1 Length of traverse 761.2 sec, 240,107 ft								
0 - 110	19,000	----	-----	----	-----	---	---	0
<sup>a</sup> 110 - 120	-----	-----	-----	-----	-----	---	---	0
120 - 130	19,500	13.9	-11.4	-----	-----	---	---	3
130 - 140	19,000	-----	-9.6	-----	-13.8	---	109	4
140 - 150	-----	4.5	-7.5	-----	-----	---	---	2
150 - 160	18,500	5.2	-3.1	-----	-5.6	---	66	2
160 - 170	-----	7.1	-5.7	-----	-11.4	---	127	2
170 - 180	18,000	10.8	-3.7	9.5	-----	133	---	4
<sup>b</sup> 180 - 190	18,500	-----	-8.9	-----	-10.2	---	132	2
190 - 230	-----	-----	-----	-----	-----	---	---	0
230 - 350	19,000	-----	-----	-----	-----	---	---	0
350 - 360	19,500	7.7	-----	-----	-----	---	---	1
360 - 370	-----	-----	-----	-----	-----	---	---	0
<sup>a</sup> 370 - 380	-----	-----	-----	-----	-----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 12, 1947 - Flight 12					
Airplane 353 - Traverse 1 Length of traverse 761.2 sec, 240,107 ft					
380 - 390	19,000	6.8	-----	-----	1
390 - 400	18,500	-----	-6.2	-----	2
400 - 410		7.5	-----	-----	1
410 - 420		8.2	-6.1	-----	2
<sup>b</sup> 420 - 430		-----	-5.8	-----	2
430 - 440		3.2	-3.6	-----	2
440 - 460		-----	-----	-----	0
460 - 550	19,000	-----	-----	-----	0
550 - 560		6.6	-----	-----	1
560 - 580		-----	-----	-----	0
580 - 590	18,500	-----	-10.0	-----	1
590 - 620		-----	-----	-----	0
<sup>a</sup> 620 - 630		-----	-4.9	-----	1
630 - 640	19,000	6.9	-3.3	12.7 -8.8	2
640 - 650		-----	-5.9	-----	1
660 - 670		-----	-----	-----	0
670 - 710	18,500	-----	-----	-----	0
710 - 720		9.2	-----	-----	1
720 - 740	19,000	-----	-----	-----	0
<sup>b</sup> 740 - 750		-----	-6.5	-----	2
750 - 760		4.4	-----	-----	1
760 - 770		-----	-----	-----	0
Airplane 354 - Traverse 1 Length of traverse 1030.0 sec, 301,770 ft					
0 - 10	14,500	2.3	-7.0	4.8	4
10 - 20		-----	-----	-----	0
20 - 30	15,000	-----	-12.6	-----	3

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 12, 1947 - Flight 12					
Airplane 354 - Traverse 1 Length of traverse 1030.0 sec, 301,770 ft					
a30 - 40	14,500	----	----	----	0
40 - 50		3.4	-5.9	----	4
b50 - 60		2.9	-5.5	----	2
60 - 70		3.3	-5.5	----	3
70 - 80		2.9	-5.0	6.7	2
a80 - 90		2.2	-3.7	----	4
90 - 100		----	-5.2	----	3
100 - 110		5.2	----	----	1
110 - 120		3.0	-5.0	----	2
120 - 130		8.7	-8.1	----	5
130 - 140		7.6	-5.4	----	6
140 - 150		----	-8.9	----	1
150 - 160		4.0	----	----	3
160 - 170		3.4	-8.4	----	6
170 - 180		6.5	-11.4	-9.6	6
180 - 190		7.9	-7.0	----	4
190 - 200		6.4	----	----	1
b200 - 210		2.4	-7.4	----	4
210 - 220		5.0	-2.9	----	3
220 - 300		----	----	----	0
300 - 310	15,000	----	----	----	0
310 - 330	14,500	----	----	----	0
a330 - 340		5.1	-7.8	----	3
340 - 350		10.8	-8.6	----	3
350 - 360		9.6	-11.0	----	6
360 - 370		15.0	-18.7	----	3
370 - 380		11.5	-8.5	----	3
380 - 390		----	-18.1	----	1
390 - 400		----	----	----	0
400 - 410	15,000	----	----	----	0
410 - 450	14,500	----	----	----	0
450 - 460	15,000	----	----	----	0
460 - 520	14,500	----	----	----	0
520 - 530	15,000	----	----	----	0

aCloud entry.

bCloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 12, 1947 - Flight 12					
Airplane 354 - Traverse 1 Length of traverse 1030.0 sec, 301,770 ft					
<sup>b</sup> 530 - 540	14,500	----	----	----	0
540 - 610		----	----	----	0
610 - 620	15,000	----	----	----	0
620 - 800	14,500	----	----	----	0
800 - 810		3.9	----	----	1
<sup>a</sup> 810 - 820		7.9	----	----	1
820 - 830		----	-8.4	----	2
830 - 840	15,000	----	-6.4	----	1
<sup>b</sup> 840 - 850	14,500	4.6	-3.5	----	2
850 - 950		----	----	----	0
<sup>a</sup> 950 - 960		2.4	----	----	1
960 - 970		2.9	----	----	1
970 - 980		----	-2.9	-6.1	1
980 - 1000		----	----	----	0
1000 - 1010	15,000	----	----	----	0
1010 - 1020	14,500	----	----	----	0
<sup>b</sup> 1020 - 1030		3.4	-4.5	----	3
Airplane 354 - Traverse 2 Length of traverse 116.7 sec, 34,514 ft					
<sup>a</sup> 0 - 10	14,500	6.2	----	----	1
10 - 20		12.7	-10.9	----	8
20 - 30	15,000	16.3	-12.6	----	5
30 - 40	14,500	18.0	-8.1	----	7
40 - 50	15,000	3.7	-15.4	----	8
<sup>b</sup> 50 - 60		4.2	-15.5	----	6
<sup>b</sup> 60 - 70	14,500	----	-5.1	----	1
70 - 120		----	----	----	0
Airplane 354 - Traverse 3 Length of traverse 167.0 sec, 49,061 ft					
0 - 10	14,500	----	----	----	0
<sup>a</sup> 10 - 30	15,000	----	----	----	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 12, 1947 - Flight 12								
Airplane 354 - Traverse 3 Length of traverse 167.0 sec, 49,061 ft								
30 - 40	15,000	7.3	-12.7	----	----	---	---	3
40 - 50		----	-8.6	----	-6.5	---	44	2
50 - 60		10.1	-3.0	16.7	----	205	---	3
60 - 70	14,500	8.2	-11.4	----	----	---	---	7
70 - 80		5.0	-12.3	----	----	---	---	4
80 - 90		8.7	-11.9	----	----	---	---	3
<sup>b</sup> 90 - 100		12.6	-15.9	----	----	---	---	5
100 - 170		----	----	----	----	---	---	0
Airplane 344 - Traverse 1 Length of traverse 544.6 sec, 146,167 ft								
0 - 100	9,500	----	----	----	----	---	---	0
<sup>a</sup> 100 - 110		----	----	----	----	---	---	0
110 - 140		----	----	----	----	---	---	0
140 - 150		----	-6.4	----	----	---	---	1
150 - 160		5.4	-6.2	----	----	---	---	3
160 - 170		----	----	----	----	---	---	0
170 - 180	10,000	----	----	----	----	---	---	0
180 - 190		7.4	----	----	----	---	---	1
190 - 200		----	-6.8	----	----	---	---	1
200 - 210		10.4	----	20.2	----	176	---	1
210 - 220		----	----	----	----	---	---	0
<sup>b</sup> 220 - 230		----	----	----	----	---	---	0
230 - 310	9,500	----	----	----	----	---	---	0
<sup>a</sup> 310 - 320		----	----	----	----	---	---	0
320 - 330		----	----	----	----	---	---	0
330 - 340		7.2	----	----	----	---	---	2
340 - 350	10,000	10.3	-14.1	----	----	---	---	2
350 - 360		4.8	----	----	----	---	---	1
360 - 370	10,500	----	----	----	----	---	---	0
370 - 380	10,000	7.7	----	----	----	---	---	1
380 - 390		----	----	----	----	---	---	0
390 - 400		12.5	-6.4	----	----	---	---	5

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 12, 1947 - Flight 12					
Airplane 344 - Traverse 1 Length of traverse 544.6 sec, 146,167 ft					
400 - 410	10,000	6.3	----	----	1
410 - 420		----	-2.3	----	1
420 - 430		5.3	-7.1	----	2
430 - 440		----	----	----	0
440 - 450		7.1	----	----	1
450 - 500	10,500	----	----	----	0
500 - 510	10,000	----	----	----	0
<sup>b</sup> 510 - 520		----	----	----	0
520 - 550		----	----	----	0
Airplane 344 - Traverse 2 Length of traverse 212.7 sec, 58,363 ft					
0 - 10	10,000	----	----	----	0
<sup>a</sup> 10 - 20		5.6	-10.3	----	4
20 - 30	9,500	7.3	-17.5	14.9	3
30 - 40		12.8	----	12.1	3
40 - 50	10,000	11.4	-16.1	----	3
50 - 60		----	----	----	0
60 - 70		5.9	-9.0	----	3
70 - 80		9.8	-6.6	----	3
80 - 90	9,500	----	----	----	0
<sup>b</sup> 90 - 100		----	----	----	0
100 - 110	10,000	----	----	----	0
<sup>a</sup> 110 - 120		3.6	-4.5	----	2
120 - 130		----	----	----	0
130 - 140		4.8	----	6.5	1
140 - 150		7.9	-4.2	----	4
150 - 160		----	----	----	0
160 - 170	9,500	4.4	----	7.1	1
<sup>b</sup> 170 - 180		----	----	----	0
180 - 190		----	-3.6	----	1
190 - 220		----	----	----	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 12, 1947 - Flight 12					
Airplane 351 - Traverse 1 Length of traverse 1284.2 sec, 309,031 ft					
0 - 150	5,500	----	----	---	0
150 - 160		5.0	7.8	114	1
<sup>a</sup> 160 - 170		13.8	21.3	149	5
170 - 180		-----	-----	---	1
180 - 190		26.5	-----	335	1
190 - 250		-----	-----	---	0
250 - 260		-----	-----	140	1
260 - 290		-----	-----	---	0
290 - 300		6.8	10.8	88	1
300 - 310		-----	-----	---	1
310 - 320		-----	-----	---	0
<sup>b</sup> 320 - 340		-----	-----	---	0
<sup>b</sup> 340 - 350		-----	-----	---	0
350 - 410		-----	-----	---	0
410 - 430	6,000	-----	-----	---	0
430 - 440	5,500	-----	-----	---	0
440 - 450		4.6	13.6	20	1
<sup>a</sup> 450 - 460		-----	-----	---	0
460 - 530		-----	-----	---	0
530 - 540		6.2	-----	---	1
540 - 610		-----	-----	---	0
<sup>b</sup> 610 - 620		-----	-----	---	0
620 - 800		-----	-----	---	0
800 - 840	6,000	-----	-----	---	0
840 - 930	5,500	-----	-----	---	0
930 - 940		-----	-----	28	1
940 - 1000		-----	-----	---	0
<sup>a</sup> 1000 - 1010		-----	-----	---	0
1010 - 1030		-----	-----	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts	
July 12, 1947 - Flight 12						
Airplane 351 - Traverse 1 Length of traverse 1284.2 sec, 309,031 ft						
1030 - 1040	5,500	11.7	-6.8	----	2	
1040 - 1050		5.8	-----	----	1	
1050 - 1060		----	-2.6	----	1	
1060 - 1070		----	-----	----	0	
1070 - 1080		----	-4.9	----	1	
1080 - 1090		----	-5.8	----	2	
1090 - 1100		----	-5.2	---- -6.9	76	2
1100 - 1110		4.9	-----	----	----	1
1110 - 1120		7.5	-----	7.4	36	1
1120 - 1130		6.5	-2.6	11.6 -10.0	86 62	2
1130 - 1140	5,000	----	-----	----	0	
1140 - 1150		4.6	-----	----	1	
1150 - 1160		6.1	-----	----	1	
1160 - 1170		----	-----	----	0	
1170 - 1180		----	-5.3	----	2	
1180 - 1190		----	-----	----	0	
<sup>b</sup> 1190 - 1200		----	-----	----	0	
1200 - 1230		5,500	----	-----	----	0
1230 - 1240			----	-7.7	----	1
1240 - 1290			----	-----	----	0
Airplane 351 - Traverse 2 Length of traverse 167.8 sec, 40,610 ft						
<sup>a</sup> 0 - 10	5,500	----	-----	----	0	
10 - 20		----	-----	----	0	
20 - 30		4.8	-----	----	1	
30 - 40		----	-----	----	0	
40 - 50		6,000	----	-----	----	0
50 - 110	----		-----	----	0	
<sup>b</sup> 110 - 120	6.5		-----	6.7	63	1
120 - 170	----		-----	----	0	

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 14, 1947 - Flight 13					
Airplane 351 - Traverse 1 Length of traverse 1053.8 sec, 315,341 ft					
0 - 30	14,500	----	----	---	0
30 - 40		9.0	----	---	1
40 - 50		----	----	---	0
<sup>a</sup> 50 - 60	15,000	11.3	-8.0	18.7	6
60 - 70		----	----	---	0
70 - 80	14,500	5.6	-10.3	11.8	2
80 - 90		11.4	-5.7	----	4
90 - 100		10.2	----	----	1
100 - 110		10.2	----	----	1
110 - 120		14.0	-13.2	----	6
120 - 130		----	-5.2	----	1
130 - 140		9.8	-7.1	----	2
140 - 150	15,000	9.7	----	----	1
150 - 170		----	----	----	0
170 - 180		8.2	-12.8	----	2
180 - 190		12.0	----	14.2	2
<sup>b</sup> 190 - 200		----	----	----	0
200 - 290		----	----	----	0
290 - 300		6.6	----	----	1
300 - 340		----	----	----	0
<sup>a</sup> 340 - 350		8.3	----	----	1
350 - 360	15,500	15.0	-8.7	----	3
360 - 370		7.0	-9.3	----	2
370 - 380	15,000	----	----	----	0
380 - 390	14,500	10.5	-10.9	----	4
390 - 400		----	-7.5	----	4
400 - 410		----	----	----	0
410 - 420		6.1	----	9.4	2
420 - 430	15,000	5.2	----	11.5	2

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts		
July 14, 1947 - Flight 13							
Airplane 351 - Traverse 1							
Length of traverse 1053.8 sec, 315,341 ft							
430 - 440	15,500	----	-9.5	----	148	1	
440 - 450		----	----	----	----	0	
450 - 460	15,000	----	----	15.7	35	1	
460 - 470		12.4	----	----	----	2	
<sup>b</sup> 470 - 480	14,500	7.8	-7.1	----	135	4	
480 - 490		10.6	----	----	----	3	
490 - 510		----	----	----	----	0	
510 - 520	15,000	----	-4.5	----	-13.5	31	1
520 - 530		4.5	-3.2	----	----	2	
530 - 580		----	----	----	----	0	
580 - 610	14,500	----	----	----	----	0	
610 - 660	15,000	----	----	----	----	0	
<sup>a</sup> 660 - 670	14,500	7.4	-4.5	----	----	2	
670 - 680		----	----	----	----	0	
680 - 690	14,000	----	----	----	----	0	
690 - 700		----	-2.7	----	----	1	
700 - 710	14,500	----	-3.4	----	-6.0	95	2
710 - 720		7.4	-7.0	10.9	133	4	
720 - 730		7.5	----	----	----	1	
730 - 740		8.5	-2.9	----	----	3	
740 - 750	15,000	5.3	----	----	----	1	
750 - 760		----	-7.9	----	----	4	
<sup>b</sup> 760 - 770		5.6	-7.6	----	----	3	
770 - 780		9.9	----	----	----	1	
780 - 810	14,500	----	----	----	----	0	
810 - 870	15,000	----	----	----	----	0	
870 - 890	15,500	----	----	----	----	0	
<sup>a</sup> 890 - 900		----	----	----	----	0	
900 - 910	15,000	----	----	----	----	0	
910 - 920		9.4	----	----	----	2	
920 - 930		----	----	----	----	0	
930 - 940	14,500	6.8	-4.9	----	----	3	
940 - 950		----	----	----	----	0	
950 - 960		9.5	-3.2	----	----	4	
960 - 970		8.4	-8.0	13.3	75	3	
970 - 980		----	-3.6	----	-6.4	89	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 14, 1947 - Flight 13					
Airplane 351 - Traverse 1 Length of traverse 1053.8 sec, 315,341 ft					
980 - 1000	15,000	----	----	---	0
<sup>b</sup> 1000 - 1010	14,500	----	----	---	0
1010 - 1020		----	----	---	0
1020 - 1060	15,000	----	----	---	0
Airplane 351 - Traverse 2 Length of traverse 552.6 sec, 175,453 ft					
0 - 90	15,000	----	----	---	0
<sup>a</sup> 90 - 100		----	----	---	0
100 - 110		----	----	---	0
110 - 120		5.8	-6.8	31	4
120 - 130	14,500	18.7	-13.1	144	6
130 - 140		5.4	-5.5	52	2
140 - 150		9.2	-6.5	---	4
150 - 160		5.5	-3.6	---	6
160 - 170		----	----	---	0
170 - 180		11.7	----	136	2
180 - 210		----	----	---	0
210 - 220		9.6	-10.8	---	6
220 - 230		10.6	-9.6	---	9
230 - 240	15,000	6.3	-4.5	---	3
240 - 260		----	----	---	0
<sup>b</sup> 260 - 270		----	----	---	0
270 - 320	14,500	----	----	---	0
320 - 350	15,000	----	----	---	0
350 - 360	14,500	----	----	---	0
360 - 370		----	-4.4	---	1
370 - 380		----	----	---	0
380 - 400	15,000	----	----	---	0
<sup>a</sup> 400 - 410	14,500	----	----	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 14, 1947 - Flight 13								
Airplane 351 - Traverse 2 Length of traverse 552.6 sec, 175,453 ft								
410 - 420	14,000	----	----	----	----	---	---	0
420 - 430		15.6	-23.0	----	----	---	---	3
430 - 440		11.5	-6.9	----	----	---	---	3
440 - 450		21.0	-6.5	20.0	----	147	---	7
450 - 460		7.8	----	----	-5.7	---	84	3
460 - 470	14,500	5.0	-5.2	----	----	---	---	2
470 - 490		----	----	----	----	---	---	0
490 - 500		8.3	----	----	----	---	---	1
500 - 510		9.4	-5.1	----	----	---	---	2
510 - 520		----	----	----	----	---	---	0
520 - 530	14,000	5.7	----	----	----	---	---	1
530 - 540		----	----	----	----	---	---	0
540 - 550		----	----	11.4	----	38	---	1
550 - 560		----	----	----	----	---	---	0
Airplane 353 - Traverse 1 Length of traverse 1055.1 sec, 274,301 ft								
0 - 70	11,000	----	----	----	----	---	---	0
70 - 80		----	-5.1	----	----	---	---	1
80 - 100		----	----	----	----	---	---	0
100 - 110		9.6	----	----	----	---	---	1
110 - 120		5.4	-5.6	11.4	----	29	---	3
120 - 130		7.3	-10.3	----	----	---	---	4
130 - 140		8.3	----	16.2	----	134	---	3
140 - 150		7.5	-3.4	----	----	---	---	2
150 - 160		5.0	-5.9	----	----	---	---	5
160 - 170		----	-5.3	----	-9.9	---	102	1
170 - 180	10,500	----	----	----	----	---	---	0
180 - 210		----	----	----	----	---	---	0
210 - 230	11,000	----	----	----	----	---	---	0

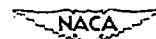
<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 14, 1947 - Flight 13					
Airplane 353 - Traverse 1					
Length of traverse 1055.1 sec, 274,301 ft					
230 - 240	11,000	----	-10.1	----	1
240 - 250	10,500	----	----	----	0
250 - 260		6.2	----	----	1
260 - 280		----	----	----	0
280 - 300	11,000	----	----	----	0
300 - 310		----	-4.5	----	1
310 - 340		----	----	----	0
<sup>a</sup> 340 - 350		10.6	-14.5	8.4 -13.8	37 139
350 - 360	10,500	14.0	-12.0	19.0 -11.7	122 122
360 - 370		13.9	-5.8	10.6	60
370 - 380		----	-9.0	----	1
380 - 400		----	----	----	0
<sup>b</sup> 400 - 410		----	----	----	0
410 - 470		----	----	----	0
470 - 570	11,000	----	----	----	0
<sup>a</sup> 570 - 580		----	-7.5	----	-17.2
580 - 590		----	-3.6	----	229
590 - 600		----	----	----	1
600 - 610		6.7	-5.7	8.9	60
610 - 620	10,500	12.0	----	----	3
620 - 630		9.7	----	----	2
630 - 640		12.2	----	----	1
640 - 650		----	----	----	0
<sup>b</sup> 650 - 660		----	----	----	0
660 - 670		----	----	----	0
670 - 680		6.2	-5.4	----	2
680 - 690		----	----	----	0
690 - 700		5.9	----	9.6	159
700 - 720		----	----	----	2
720 - 780		----	----	----	0
780 - 820	11,000	----	----	----	0
820 - 830		6.0	-3.8	----	2
830 - 840		7.9	----	11.5	169
840 - 870		----	----	----	1
		----	----	----	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts		
July 14, 1947 - Flight 13							
Airplane 353 - Traverse 1 Length of traverse 1055.1 sec, 274,301 ft							
870 - 880	11,000	3.2	-----	-----	1		
880 - 890		-----	-----	-----	0		
890 - 900		4.7	-----	-----	1		
<sup>a</sup> 900 - 910		8.6	-5.8	8.5	67	3	
910 - 920	10,500	7.5	-8.5	-----	-----	4	
920 - 930		11.7	-5.0	-----	-17.6	95	5
930 - 940		22.2	-11.0	-----	-----	-----	9
940 - 950		6.2	-3.2	17.5	-----	36	3
950 - 960		10.8	-4.9	-----	-----	-----	3
960 - 970	11,000	9.2	-5.0	-----	-----	-----	6
970 - 980		7.3	-6.9	-----	-----	-----	6
980 - 990		16.2	-14.8	-----	-16.5	78	4
990 - 1000	11,500	10.0	-----	-----	-----	-----	3
<sup>b</sup> 1000 - 1010		7.6	-----	-----	-----	-----	1
1010 - 1020		-----	-----	-----	-----	-----	0
1020 - 1030		-----	-----	-----	-----	-----	0
1030 - 1060	11,000	-----	-----	-----	-----	-----	0
Airplane 353 - Traverse 2 Length of traverse 1001.5 sec, 258,739 ft							
0 - 130	10,500	-----	-----	-----	-----	-----	0
130 - 250	11,000	-----	-----	-----	-----	-----	0
<sup>a</sup> 250 - 260	10,500	-----	-4.5	-----	-----	-----	1
260 - 270		-----	-----	-----	-----	-----	0
270 - 280		6.7	-6.7	-----	-----	-----	7
280 - 290		3.4	-4.7	-----	-----	-----	2
290 - 300		2.1	-7.9	8.4	-----	101	2
300 - 310		6.9	-6.5	-----	-8.7	152	5
310 - 320		7.3	-10.9	-----	-2.8	120	6
320 - 330		8.2	-----	16.1	-----	159	2
330 - 340	11,000	7.4	-5.8	-----	-----	-----	4
340 - 350		6.2	-----	-----	-----	-----	2

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 14, 1947 - Flight 13					
Airplane 353 - Traverse 2 Length of traverse 1001.5 sec, 258,739 ft					
350 - 360	11,000	----	-9.5	----	3
360 - 380		----	----	----	0
380 - 390		----	-4.5	----	1
390 - 410		----	----	----	0
410 - 420		6.7	-10.6	11.7	8
420 - 430	10,500	8.0	-8.7	----	4
430 - 440		7.1	----	----	3
440 - 450	10,000	2.7	-4.3	-8.6	3
450 - 460		----	-4.5	----	1
460 - 470		4.3	----	----	1
470 - 480		6.3	----	----	1
480 - 490		----	-5.1	----	1
<sup>b</sup> 490 - 500		----	----	----	0
500 - 560		----	----	----	0
560 - 630	10,500	----	----	----	0
630 - 640		----	-7.1	-15.3	1
640 - 700		----	----	----	0
<sup>a</sup> 700 - 710		8.9	-5.3	----	2
710 - 720		7.7	-9.3	----	4
720 - 730		7.0	-3.9	----	4
730 - 740		9.2	-16.5	----	3
740 - 750		----	-4.8	----	1
750 - 760		----	----	----	0
760 - 770		----	-4.2	-7.9	1
770 - 780		----	----	----	0
780 - 790		5.4	----	----	1
790 - 800		----	-6.4	-8.5	2
800 - 810		4.4	-4.7	----	2
810 - 820		4.7	-8.4	-11.2	5
820 - 830		10.7	-6.0	----	6
830 - 840		8.4	-7.8	----	3
840 - 890	11,000	----	----	----	0
890 - 900		----	-4.7	----	1
900 - 910		3.1	----	----	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 14, 1947 - Flight 13								
Airplane 353 - Traverse 2 Length of traverse 1001.5 sec, 258,739 ft								
910 - 930	11,000	----	-----	----	-----	---	---	0
930 - 940		----	-3.4	----	-----	---	---	1
<sup>b</sup> 940 - 950	10,500	----	-----	----	-----	---	---	0
950 - 1010		----	-----	----	-----	---	---	0
Airplane 348 - Traverse 1 Length of traverse 1255.8 sec, 299,516 ft								
0 - 10	6,000	----	-----	----	-----	---	---	0
10 - 30	5,500	----	-----	----	-----	---	---	0
30 - 40		----	-4.1	----	-----	---	---	1
40 - 50		----	-2.8	----	-----	---	---	1
50 - 60		----	-1.9	----	-----	---	---	1
60 - 70		----	-3.5	----	-----	---	---	1
70 - 160		----	-----	----	-----	---	---	0
<sup>a</sup> 160 - 170		----	-----	----	-----	---	---	0
170 - 220		----	-----	----	-----	---	---	0
220 - 230		----	-3.2	----	-----	---	---	1
230 - 250		----	-----	----	-----	---	---	0
250 - 260		8.2	-10.4	----	-8.0	---	80	5
260 - 270		3.2	-5.0	----	-----	---	---	4
270 - 280		----	-2.8	----	-----	---	---	1
280 - 290		2.5	-6.0	----	-----	---	---	2
290 - 300		3.2	-11.7	----	-----	---	---	6
300 - 310		----	-4.7	----	-----	---	---	1
<sup>b</sup> 310 - 320		6.0	-5.7	----	-----	---	---	5
320 - 330		3.8	-----	----	-----	---	---	2
330 - 340		----	-----	----	-----	---	---	0
340 - 350		----	-3.8	----	-----	---	---	1
350 - 360		----	-----	----	-----	---	---	0
360 - 370		3.8	-4.7	----	-----	---	---	2
370 - 380		7.6	-----	----	-----	---	---	1
380 - 390		7.9	-----	----	-----	---	---	1
390 - 400		----	-4.4	----	-----	---	---	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 14, 1947 - Flight 13								
Airplane 348 - Traverse 1 Length of traverse 1255.8 sec, 299,516 ft								
400 - 410	5,500	3.8	-----	5.1	-----	38	---	1
410 - 420		8.2	-----	-----	-----	---	---	1
420 - 430		10.7	-----	-----	-10.0	---	63	3
430 - 440		10.0	-7.3	11.7	-----	220	---	7
440 - 450		12.6	-10.7	-----	-----	---	---	9
450 - 460		4.4	-6.2	7.9	-10.9	88	20	7
460 - 470		5.0	-5.5	-----	-7.9	---	95	3
470 - 480		-----	-----	-----	-----	---	---	0
480 - 490		4.0	-3.6	-----	-4.3	---	63	3
<sup>a</sup> 490 - 500		2.9	-5.2	-----	-----	---	---	2
500 - 510		2.4	-----	7.0	-----	63	---	1
510 - 520		-----	-6.4	-----	-9.1	---	128	2
520 - 530		-----	-5.9	-----	-----	---	---	1
530 - 540		8.1	-----	-----	-----	---	---	2
540 - 550		7.8	-6.2	-----	-----	---	---	5
550 - 560		2.3	-----	3.8	-----	72	---	1
560 - 580		-----	-----	-----	-----	---	---	0
580 - 590		3.5	-5.0	6.2	-----	161	---	3
590 - 620		-----	-----	-----	-----	---	---	0
<sup>b</sup> 620 - 630		-----	-----	-----	-----	---	---	0
630 - 650		-----	-----	-----	-----	---	---	0
650 - 660		-----	-8.5	-----	-----	---	---	1
660 - 670		4.2	-9.2	-----	-----	---	---	2
670 - 680		4.2	-7.2	-----	-----	---	---	2
680 - 690		-----	-2.0	-----	-5.0	---	75	1
690 - 700		-----	-3.7	-----	-----	---	---	1
700 - 710	5,000	5.1	-3.7	-----	---	---	3	
710 - 720		5.5	-----	-----	---	---	1	
720 - 730		6.4	-----	-----	---	---	1	
730 - 750		-----	-----	-----	---	---	0	

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 14, 1947 - Flight 13					
Airplane 348 - Traverse 1 Length of traverse 1255.8 sec, 299,516 ft					
750 - 760	5,000	2.2	4.9	19	1
760 - 770		5.7 -4.5			5
770 - 780		5.8	9.2	85	1
780 - 790		2.9 -5.1			2
<sup>a</sup> 790 - 800		2.7 -4.9	4.7	48	4
800 - 810					0
810 - 820		4.5 -2.5	7.3 -4.2	74 59	2
820 - 830	5,500	-5.8			1
830 - 840		-5.4	-11.3	25	2
<sup>b</sup> 840 - 850		5.6 -5.6			9
850 - 860		3.2 -8.9			3
860 - 870	5,000	7.2 -6.5			4
870 - 880		4.2 -6.6			5
880 - 890		2.5			1
890 - 900					0
900 - 910	5,500	3.2 -3.0			4
910 - 920		4.5 -7.0	-3.6	65	5
920 - 930		6.1 -10.9	11.1	23	4
930 - 940		-9.4			3
940 - 950	5,000	12.3			1
950 - 960		5.8 -15.4			4
960 - 970		4.2 -13.8	9.2 -5.2	55 90	4
970 - 980					0
<sup>a</sup> 980 - 990	5,500	4.9 -5.4	-9.0	62	3
990 - 1000		3.2 -4.8	-15.2	71	3
1000 - 1010		3.1 -15.6	9.2	24	3
1010 - 1020		3.7 -4.9			5
1020 - 1030		6.2 -8.3			5
1030 - 1040		-4.8			1
1040 - 1140					0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts	
July 14, 1947 - Flight 13									
Airplane 348 - Traverse 1 Length of traverse 1255.8 sec, 299,516 ft									
<sup>b</sup> 1140 - 1150	5,500	----	-----	----	-----	---	---	0	
1150 - 1160		----	-3.2	----	-----	---	---	1	
1160 - 1170		3.1	-5.3	5.6	-4.5	88	77	5	
1170 - 1180		2.4	-3.9	----	-----	---	---	2	
1180 - 1260		----	-----	----	-----	---	---	0	
Airplane 348 - Traverse 2 Length of traverse 818.8 sec, 190,330 ft									
0 - 30	5,500	----	-----	----	-----	---	---	0	
30 - 40		4.1	-----	----	-----	---	---	1	
40 - 110		----	-----	----	-----	---	---	0	
<sup>a</sup> 110 - 120		----	-----	----	-----	---	---	0	
120 - 150		----	-----	----	-----	---	---	0	
150 - 160		----	-3.7	----	-4.1	---	106	1	
160 - 170		----	-3.2	----	-----	---	---	1	
170 - 180		----	-2.1	----	-----	---	---	1	
180 - 190		6,000	----	-2.7	----	-----	---	---	3
190 - 200			----	-3.4	----	-5.0	---	44	1
200 - 210	----		-----	----	-----	---	---	0	
210 - 220	----		-3.3	----	-----	---	---	1	
220 - 270	----		-----	----	-----	---	---	0	
270 - 280	----		-4.7	----	-----	---	---	2	
280 - 290	----	-2.8	----	-----	---	---	2		
290 - 300	----	-----	----	-----	---	---	0		
300 - 310	----	-2.7	----	-----	---	---	1		
310 - 320	6,000	6.5	-7.3	----	-----	---	---	10	
320 - 330		8.0	-12.1	----	-----	---	---	6	
330 - 340		4.6	-5.8	----	-----	---	---	6	
<sup>b</sup> 340 - 350		5.0	-----	6.1	-----	175	---	1	
350 - 410		----	-----	----	-----	---	---	0	

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 14, 1947 - Flight 13								
Airplane 348 - Traverse 2 Length of traverse 818.8 sec, 190,330 ft								
410 - 420	6,000	11.5	-3.1	----	-4.1	---	71	5
420 - 430		----	----	----	----	---	---	0
430 - 440		3.1	----	----	----	---	---	2
440 - 450		----	----	----	----	---	---	0
450 - 460		2.9	----	----	----	----	---	1
460 - 490	6,500	----	----	----	----	---	---	0
<sup>a</sup> 490 - 500		----	----	----	----	---	---	0
500 - 510		4.9	-8.2	----	----	---	---	3
510 - 520		5.7	-9.9	----	----	---	---	4
520 - 530		9.1	-10.0	----	----	---	---	3
530 - 540	6,000	6.3	-13.6	----	----	---	---	5
540 - 550		5.6	-8.0	----	----	---	---	8
550 - 560		13.2	-6.7	10.2	----	28	---	7
560 - 570		6.0	-7.7	----	-14.1	---	63	6
570 - 580		14.0	-12.4	----	----	---	---	5
580 - 590	6,500	----	-6.7	----	----	---	---	6
590 - 600		7.5	-6.2	----	----	---	---	3
600 - 610		2.9	----	----	----	---	---	1
610 - 620		----	-2.6	----	----	---	---	1
620 - 650		----	----	----	----	---	---	0
650 - 660		2.9	----	----	----	---	---	1
660 - 680		----	----	----	----	---	---	0
680 - 690		2.4	-3.8	----	----	---	---	2
690 - 700		2.9	-4.7	----	----	---	---	3
700 - 710		----	-6.0	----	-4.2	---	153	3
<sup>b</sup> 710 - 720		2.3	-5.8	5.0	----	57	---	3
720 - 730		2.9	----	----	----	---	---	2
730 - 740		----	-5.1	----	----	---	---	4
740 - 750		----	-2.5	----	----	---	---	1
750 - 760		----	-4.4	----	----	---	---	2
760 - 770		----	-3.2	----	----	---	---	1
770 - 780		----	----	----	----	---	---	0
780 - 790		----	-2.5	----	----	---	---	1
790 - 800		----	-2.6	----	----	---	---	1
800 - 820		----	----	----	----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 14					
Airplane 348 - Traverse 1 Length of traverse 211.0 sec, 60,255 ft					
0 - 90	14,000	----	----	----	0
<sup>a</sup> 90 - 100		----	----	----	0
100 - 140		----	----	----	0
140 - 150		2.3	5.5	108	1
150 - 200		----	----	----	0
<sup>b</sup> 200 - 210		----	----	----	0
210 - 220		----	----	----	0
Airplane 348 - Traverse 2 Length of traverse 231.5 sec, 66,661 ft					
0 - 10	14,000	----	----	----	0
<sup>a</sup> 10 - 20		----	----	----	0
20 - 120		----	----	----	0
120 - 130		7.4	-6.1	116	3
130 - 140		9.6	----	----	2
140 - 150		7.0	----	----	3
150 - 160		----	----	----	0
160 - 170		11.2	-6.7	----	4
170 - 180		----	----	----	0
<sup>b</sup> 180 - 190		----	----	----	0
190 - 220	14,500	----	----	----	0
220 - 240	14,000	----	----	----	0
Airplane 348 - Traverse 3 Length of traverse 1892.3 sec, 553,701 ft					
0 - 20	14,000	----	----	----	0
<sup>a</sup> 20 - 30		----	-7.3	----	1
30 - 40	13,500	5.1	-5.1	----	3
40 - 50		4.5	----	----	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 14					
Airplane 348 - Traverse 3 Length of traverse 1892.3 sec, 553,701 ft					
50 - 60	13,500	----	-8.3	----	3
60 - 70		3.5	----	----	1
70 - 110		----	----	----	0
110 - 120		5.4	-5.4	----	3
120 - 130		5.1	----	----	2
130 - 140		4.5	-6.1	14.9	4
140 - 150		----	----	----	0
<sup>b</sup> 150 - 160		----	----	----	0
160 - 170		2.9	----	----	3
170 - 190		----	----	----	0
190 - 200		----	-4.8	----	3
200 - 210		----	----	----	0
210 - 220		12.4	-8.0	----	5
220 - 230		14.7	-15.9	----	3
230 - 240		7.3	-7.0	----	3
240 - 250	14,000	8.3	-5.4	----	3
<sup>a</sup> 250 - 260		11.1	-12.7	----	4
<sup>a</sup> 260 - 270		----	----	----	0
270 - 280		8.6	-10.2	----	5
280 - 290		8.3	-7.0	----	3
290 - 300		13.4	-21.3	----	3
<sup>b</sup> 300 - 410		----	----	----	0
<sup>b</sup> 410 - 420		----	----	----	0
420 - 520		----	----	----	0
520 - 530		2.5	----	----	1
530 - 540		----	-4.8	----	2
540 - 550		4.8	-4.1	----	2
550 - 560		2.2	----	----	2
560 - 570		5.4	----	----	2
570 - 580		----	-5.4	----	3
580 - 590		----	-5.4	----	1
590 - 630	13,500	----	----	----	0
630 - 650	14,000	----	----	----	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 14					
Airplane 348 - Traverse 3 Length of traverse 1892.3 sec, 553,701 ft					
<sup>a</sup> 650 - 660	14,000	----	----	----	0
660 - 670		----	-4.4	----	2
670 - 810		----	----	----	0
810 - 820		----	-6.7	----	1
820 - 830		6.7	-5.4	----	9
830 - 840		5.1	-16.8	----	3
840 - 850		11.1	-6.7	----	6
850 - 860		7.9	-20.6	----	6
860 - 870		11.4	----	----	3
870 - 880		7.6	-17.4	----	3
880 - 890		8.9	-17.7	----	2
890 - 900		8.2	-6.7	----	3
900 - 910	14,500	9.5	-11.7	----	6
910 - 920		3.8	-13.9	----	2
920 - 930		5.1	-10.1	----	6
930 - 940		9.2	-7.9	----	2
<sup>b</sup> 940 - 950		----	----	----	0
950 - 990		----	----	----	0
990 - 1040	14,000	----	----	----	0
1040 - 1050		----	-7.0	----	1
1050 - 1230		----	----	----	0
<sup>a</sup> 1230 - 1240		----	----	----	0
1240 - 1260		----	----	----	0
<sup>b</sup> 1260 - 1270		----	----	----	0
1270 - 1280		----	----	----	0
1280 - 1290	13,500	----	----	----	0
1290 - 1320	14,000	----	----	----	0
<sup>a</sup> 1320 - 1330		----	----	----	0
1330 - 1470		----	----	----	0
1470 - 1500	13,500	----	----	----	0
1500 - 1520	14,000	----	----	----	0
1520 - 1800	13,500	----	----	----	0
<sup>b</sup> 1800 - 1810		----	----	----	0
1810 - 1850		----	----	----	0
1850 - 1900	14,000	----	----	----	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 14								
Airplane 353 - Traverse 1 Length of traverse 107.6 sec, 29,206 ft								
0 - 10	8,500	----	-3.7	----	----	---	---	1
<sup>a</sup> 10 - 20	9,000	6.4	-6.3	----	----	---	---	5
<sup>b</sup> 20 - 30		11.7	-12.2	----	----	---	---	8
30 - 40		----	----	----	----	---	---	0
40 - 50		7.3	----	15.8	----	147	---	1
50 - 70		----	----	----	----	---	---	0
<sup>a</sup> 70 - 80		----	----	----	----	---	---	0
80 - 90		----	----	----	----	---	---	0
<sup>b</sup> 90 - 100		3.4	----	11.9	----	101	---	1
100 - 110		----	----	----	----	---	---	0
Airplane 353 - Traverse 2 Length of traverse 250.7 sec, 144,049 ft.								
0 - 20	8,500	----	----	----	----	---	---	0
20 - 70	9,000	----	----	----	----	---	---	0
70 - 80		8.7	-4.7	----	----	---	---	2
80 - 90		7.9	-13.4	----	----	---	---	4
90 - 130		----	----	----	----	---	---	0
130 - 140		3.4	----	----	----	---	---	1
<sup>a</sup> 140 - 150		7.7	-4.2	----	-17.7	---	384	3
150 - 160		3.1	-12.0	14.8	----	31	---	7
160 - 170		17.7	-14.3	----	----	---	---	8
170 - 180		11.6	-14.7	20.2	----	91	---	7
180 - 190		----	-3.4	----	----	---	---	1
190 - 200		----	----	----	----	---	---	0
<sup>b</sup> 200 - 210		3.4	-7.1	7.8	----	20	---	2
210 - 220		----	-3.8	----	-8.9	---	29	1
220 - 260	9,500	----	----	----	----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 14								
Airplane 353 - Traverse 3 Length of traverse 66.4 sec, 19,118 ft								
<sup>a</sup> 0 - 10	8,500	7.5	-4.8	----	-----	---	---	3
10 - 20	9,000	7.6	-13.7	22.8	-----	215	---	5
<sup>b</sup> 20 - 30	8,500	----	-----	----	-----	---	---	0
<sup>a</sup> 30 - 40	9,000	9.4	-10.2	16.2	-----	100	---	6
40 - 50		9.4	-14.4	----	-----	---	---	5
50 - 60	8,500	----	-8.7	----	-----	---	---	1
<sup>b</sup> 60 - 70		----	-----	----	-----	---	---	0
Airplane 353 - Traverse 4 Length of traverse 124.9 sec, 36,802 ft								
<sup>a</sup> 0 - 10	9,000	16.3	-15.8	----	-----	---	---	6
10 - 20	8,500	17.8	-----	----	-----	---	---	1
20 - 30		14.9	-11.2	----	-13.8	---	207	10
30 - 40	9,000	7.9	-8.0	14.9	-----	117	---	2
40 - 50		16.5	-15.8	----	-----	---	---	9
50 - 60		6.1	-8.2	----	-----	---	---	6
60 - 70		7.0	-----	----	-6.5	---	62	2
70 - 80	8,500	----	-4.7	----	-7.7	---	143	2
80 - 90		4.0	-----	----	-----	---	---	2
90 - 100		7.6	-4.0	11.8	-----	70	---	2
100 - 110		2.6	-4.4	----	-----	---	---	3
<sup>b</sup> 110 - 120		----	-----	----	-----	---	---	0
<sup>b</sup> 120 - 130		----	-----	----	-----	---	---	0
Airplane 353 - Traverse 5 Length of traverse 1104.0 sec, 316,931 ft								
0 - 10	9,000	----	-----	----	-----	---	---	0
10 - 20		7.8	-----	----	-----	---	---	1
20 - 30		----	-----	----	-----	---	---	0
30 - 40		12.5	-7.9	----	-----	---	---	4
<sup>a</sup> 40 - 50		8.7	-7.6	----	-----	---	---	6
50 - 60	8,500	11.3	-11.2	----	-----	---	---	7
60 - 70		16.2	-19.7	----	-----	---	---	6

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 14								
Airplane 353 - Traverse 5								
Length of traverse 1104.0 sec, 316,931 ft								
70 - 80	8,500	7.5	-5.2	----	-----	---	---	4
80 - 90	9,000	19.2	-6.5	----	-----	---	---	5
90 - 100		20.1	-7.3	----	-----	---	---	2
100 - 110		----	-8.1	----	-----	---	---	4
110 - 120	8,500	8.5	-9.2	9.3	-----	121	---	3
120 - 130		19.4	-6.6	----	-----	---	---	5
130 - 140		----	-----	----	-----	---	---	0
140 - 150		6.5	-----	----	-----	---	---	1
150 - 160		4.5	-7.8	----	-----	---	---	5
160 - 170		10.3	-----	----	-----	---	---	4
170 - 180		2.9	-9.6	----	-----	---	---	5
180 - 190		10.6	-5.9	----	-----	---	---	3
190 - 200		8.5	-6.1	11.5	-----	143	---	4
200 - 210		4.6	-6.6	----	-----	---	---	4
210 - 220		5.4	-5.8	----	-----	---	---	3
220 - 230		3.1	-7.3	----	-----	---	---	3
230 - 240		----	-5.7	----	-----	---	---	1
240 - 250		10.1	-3.9	----	-----	---	---	4
250 - 260		3.9	-8.2	----	-----	---	---	3
260 - 270		6.6	-3.9	11.6	-----	138	---	4
<sup>b</sup> 270 - 280		----	-----	----	-----	---	---	0
<sup>a,b</sup> 280 - 290		3.3	-----	7.8	-----	129	---	1
290 - 330		----	-----	----	-----	---	---	0
<sup>a</sup> 330 - 340		5.5	-12.6	7.9	-----	37	---	4
340 - 350		----	-10.2	----	-----	---	---	5
<sup>b</sup> 350 - 360		----	-----	----	-----	---	---	0
360 - 370		----	-----	----	-----	---	---	0
<sup>a,b</sup> 370 - 380		11.6	-9.6	20.8	-----	182	---	2
380 - 390	8,000	----	-----	----	-----	---	---	0
390 - 460	8,500	----	-----	----	-----	---	---	0
460 - 470	8,000	----	-----	----	-----	---	---	0
470 - 540	8,500	----	-----	----	-----	---	---	0
540 - 660	9,000	----	-----	----	-----	---	---	0

<sup>a</sup>cloud entry.<sup>b</sup>cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts			
July 18, 1947 - Flight 14								
Airplane 353 - Traverse 5								
Length of traverse 1104.0 sec, 316,931 ft								
660 - 670	9,000	8.0	-----	16.3	-----	80	---	1
670 - 700		---	---	---	---	---	---	0
<sup>a</sup> 700 - 710		4.8	-15.7	---	---	---	---	8
<sup>b</sup> 710 - 720	8,500	---	---	---	---	---	---	0
720 - 730		---	---	---	---	---	---	0
730 - 770	9,000	---	---	---	---	---	---	0
<sup>a</sup> 770 - 780	9,500	5.4	---	---	---	---	---	1
780 - 790	9,000	---	-7.8	---	---	---	---	2
790 - 800		5.7	---	6.6	---	36	---	1
800 - 810	8,500	6.3	-5.7	---	---	---	---	3
810 - 820		10.3	---	---	---	---	---	3
820 - 830		2.8	---	6.2	---	23	---	1
830 - 840		3.9	-4.4	---	-7.0	---	173	2
840 - 850		---	---	---	---	---	---	0
850 - 860		---	-2.4	---	-6.1	---	38	1
860 - 870		---	---	---	---	---	---	0
870 - 880		5.4	---	---	---	---	---	1
880 - 890		5.4	---	10.1	---	212	---	2
890 - 900	8,000	---	-4.1	---	-12.0	---	142	1
900 - 910		2.5	-4.3	---	---	---	---	2
910 - 920	8,500	---	---	---	---	---	---	0
920 - 930		7.3	-6.9	---	-10.4	---	81	6
930 - 940		4.8	-6.4	---	---	---	---	2
940 - 950		---	---	---	---	---	---	0
950 - 960		---	-8.8	---	-11.3	---	106	2
960 - 970		4.2	-4.5	---	---	---	---	2
<sup>b</sup> 970 - 980		---	---	---	---	---	---	0
980 - 990		---	---	---	---	---	---	0
990 - 1000	9,000	---	---	---	---	---	---	0
1000 - 1010		---	-7.3	---	---	---	---	1
1010 - 1020		---	---	---	---	---	---	0
<sup>a</sup> 1020 - 1030		6.1	-4.3	17.8	---	142	---	5

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
July 18, 1947 - Flight 14								
Airplane 353 - Traverse 5 Length of traverse 1104.0 sec, 316,931 ft								
1030 - 1040	8,500	10.7	-----	9.8	-----	114	---	2
1040 - 1050		13.8	-7.7	-----	-----	---	---	4
1050 - 1060	9,000	5.9	-23.8	-----	-----	---	---	4
1060 - 1070		10.9	-5.4	-----	-----	---	---	4
1070 - 1080		-----	-----	-----	-----	---	---	0
1080 - 1110		-----	-----	-----	-----	---	---	0
Airplane 353 - Traverse 6 Length of traverse 651.7 sec, 223,356 ft								
0 - 230	8,500	----	-----	----	-----	---	---	0
230 - 270	9,000	----	-----	----	-----	---	---	0
270 - 280		----	-3.8	----	-----	---	---	1
280 - 290		----	-----	----	-----	---	---	0
290 - 300		2.9	-----	4.7	-----	100	---	1
300 - 430	8,500	----	-----	----	-----	---	---	0
430 - 480	9,000	----	-----	----	-----	---	---	0
480 - 620	8,500	----	-----	----	-----	---	---	0
620 - 660	9,000	----	-----	----	-----	---	---	0
Airplane 344 - Traverse 1 Length of traverse 225.6 sec, 59,550 ft								
0 - 10	4,000	----	-----	----	-----	---	---	0
10 - 20		3.4	-3.7	----	-----	---	---	3
20 - 60		----	-----	----	-----	---	---	0
60 - 70		2.7	-2.9	----	-----	---	---	2
70 - 90		----	-----	----	-----	---	---	0
90 - 100		----	-----	----	-----	---	---	0
100 - 110		1.8	-----	----	-----	---	---	1
110 - 120		4.6	-----	----	-----	---	---	2
120 - 130		5.2	-4.0	----	-----	---	---	4
130 - 140		----	-----	----	-----	---	---	0
140 - 150		----	-----	----	-----	---	---	0
150 - 230		----	-----	----	-----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 13, 1947 - Flight 14					
Airplane 344 - Traverse 2 Length of traverse 2403.4 sec, 636,209 ft					
0 - 80	4,000	----	-----	---	0
<sup>a</sup> 80 - 90		----	-----	---	0
90 - 140		----	-----	---	0
140 - 150		2.5	-----	---	2
150 - 160		3.1	-----	---	2
160 - 170		----	-----	---	0
170 - 180	4,500	----	-4.2	---	1
180 - 190	4,000	9.0	-10.8	-7.8	7
190 - 200		8.4	-8.0	---	9
200 - 210		5.5	-5.0	6.4	5
210 - 220	3,500	3.6	-----	36	1
220 - 250		----	-----	---	0
<sup>b</sup> 250 - 260		----	-----	---	0
260 - 270		----	-----	---	0
270 - 320	4,000	----	-----	---	0
320 - 330		9.1	-----	---	1
330 - 340		12.5	-4.5	---	2
340 - 350		----	-4.0	---	2
350 - 360		5.5	-----	---	1
360 - 370		----	-----	---	0
370 - 380		0.5	-----	---	1
380 - 400		----	-----	---	0
400 - 410		5.6	-----	---	1
410 - 420		6.1	-----	---	1
420 - 430		----	-----	---	0
430 - 440		5.7	-----	---	1
440 - 450		----	-----	---	0
450 - 460		4.8	-----	---	1
460 - 470		----	-4.2	---	1
470 - 500		----	-----	---	0
<sup>a</sup> 500 - 510		2.6	-----	---	1
510 - 520		5.4	-3.3	---	2
520 - 530		----	-3.3	---	1
530 - 540		4.4	-----	---	2

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 14					
Airplane 344 - Traverse 2 Length of traverse 2403.4 sec, 636,209 ft					
540 - 550	4,000	7.1	-7.7	----	6
550 - 560		8.3	-5.8	----	6
560 - 570		9.4	-13.4	----	7
570 - 580		9.5	-----	----	5
580 - 590		8.3	-3.6	----	3
590 - 600		----	-----	----	0
<sup>b</sup> 600 - 610		----	-----	----	0
610 - 660		----	-----	----	0
<sup>a</sup> 660 - 670		2.6	-----	----	1
670 - 680		3.3	-6.3	---- -8.7	6
680 - 690		8.4	-7.8	----	6
690 - 700		11.2	-12.0	----	5
700 - 710		4.6	-10.1	----	3
<sup>b</sup> 710 - 720		8.6	-3.5	----	3
720 - 730		7.7	-6.4	---- -9.2	3
730 - 740		6.2	-6.6	----	6
740 - 750		4.6	-4.0	----	3
750 - 760		15.3	-7.4	----	3
760 - 770		9.2	-5.9	----	3
770 - 780		8.7	-4.0	----	3
780 - 790		----	-7.7	----	2
790 - 800		----	-----	----	0
800 - 810		3.6	-4.9	----	2
810 - 820		4.1	-5.1	----	2
820 - 830		3.9	-4.0	4.0 ----	2
830 - 840		----	-----	----	0
840 - 850		5.0	-2.2	----	3
850 - 860		----	-----	----	0
860 - 870		12.6	-----	14.2 ----	1
870 - 880		----	-----	----	0
<sup>a</sup> 880 - 890		----	-----	----	0
<sup>b</sup> 890 - 900		----	-----	----	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 14					
Airplane 344 - Traverse 2 Length of traverse 2403.4 sec, 636,209 ft					
900 - 910	4,000	----	----	----	0
<sup>a</sup> 910 - 920		5.8	-5.6	5.0	5
920 - 930		5.3	-----	8.2	1
930 - 940		-----	-----	-----	0
940 - 950		-----	-4.2	-----	1
950 - 990		-----	-----	-----	0
<sup>b</sup> 990 - 1000		-----	-----	-----	0
1000 - 1090		-----	-----	-----	0
1090 - 1100		1.7	-----	-----	1
1100 - 1110		-----	-4.9	-----	1
1110 - 1330	4,500	-----	-----	-----	0
<sup>a</sup> 1330 - 1340		6.2	-3.0	-----	2
1340 - 1350		10.0	-9.2	-----	6
1350 - 1360		9.1	-10.0	-3.3	8
1360 - 1370		-----	-2.0	-6.3	1
1370 - 1380		-----	-7.0	-----	1
1380 - 1390		1.8	-----	-----	1
<sup>b</sup> 1390 - 1400	5,000	-----	-----	-----	0
1400 - 1410		-----	-----	-----	0
1410 - 1420		-----	-4.1	-----	2
1420 - 1430	4,500	-----	-4.6	-----	1
1430 - 1440		9.7	-1.8	-----	3
1440 - 1450		5.2	-5.4	-----	3
1450 - 1460		4.7	-7.6	-----	4
1460 - 1470		10.1	-10.5	-----	5
1470 - 1480		5.0	-----	-----	3
1480 - 1490		8.4	-8.2	-----	4
1490 - 1500	4,000	6.9	-3.9	8.3	5
1500 - 1520		-----	-----	-----	0
1520 - 1530		10.9	-----	-----	1
1530 - 1540		-----	-7.5	-----	1
1540 - 1550		6.7	-5.6	-----	4

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 14								
Airplane 344 - Traverse 2 Length of traverse 2403.4 sec, 636,209 ft								
1550 - 1560	4,000	9.6	-4.4	----	-----	---	---	4
1560 - 1570		4.4	-3.8	----	-----	---	---	5
1570 - 1580		5.5	-3.3	----	-6.8	---	151	3
1580 - 1590		4.2	-5.2	----	-----	---	---	2
1590 - 1600		----	-4.4	----	-----	---	---	1
<sup>a</sup> 1600 - 1610	4,500	3.0	-----	----	-----	---	---	2
1610 - 1620		13.0	-9.5	----	-12.3	---	68	9
1620 - 1630		7.9	-5.7	----	-----	---	---	7
1630 - 1640		5.2	-3.4	----	-----	---	---	5
1640 - 1650		17.8	-4.4	----	-----	---	---	4
1650 - 1660	4,000	11.5	-9.8	----	-----	---	---	2
1660 - 1720		----	-----	----	-----	---	---	0
<sup>b</sup> 1720 - 1730	4,000	----	-----	----	-----	---	---	0
1730 - 1770		----	-----	----	-----	---	---	0
1770 - 1780		4.3	-----	----	-----	---	---	1
1780 - 1830		----	-----	----	-----	---	---	0
1830 - 1840		2.3	-3.3	4.----	-----	---	---	4
1840 - 2410		----	-----	----	-----	---	---	0
July 18, 1947 - Flight 15								
Airplane 348 - Traverse 1 Length of traverse 442.8 sec, 150,663 ft								
0 - 110	25,000	----	-----	----	-----	---	---	0
<sup>a</sup> 110 - 120		----	-----	----	-----	---	---	0
120 - 190		----	-----	----	-----	---	---	0
190 - 200		1.6	-5.0	7.1	-----	31	---	2
200 - 210		----	-----	----	-----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 15								
Airplane 348 - Traverse 1 Length of traverse 442.8 sec, 150,668 ft								
210 - 220	25,000	----	-----	----	-11.6	---	148	1
220 - 270		----	-----	----	-----	---	---	0
270 - 280	24,500	----	-----	----	-----	---	---	0
280 - 290		1.7	-6.2	----	-5.3	---	75	3
290 - 310		----	-----	----	-----	---	---	0
310 - 320		----	-6.9	----	-----	---	---	1
320 - 330		----	-7.5	----	-----	---	---	1
330 - 340	24,000	2.7	-----	----	-----	---	---	2
340 - 350	23,500	----	-4.2	----	-----	---	---	1
350 - 360		----	-----	----	-----	---	---	0
360 - 380	24,000	----	-----	----	-----	---	---	0
380 - 390		----	-----	7.0	-----	39	---	1
390 - 400		----	-----	----	-----	---	---	0
400 - 410	23,500	----	-----	----	-----	---	---	0
410 - 420		4.8	-11.9	----	-----	---	---	2
420 - 430		5.1	-5.0	6.0	-----	64	---	6
430 - 440		----	-----	----	-----	---	---	0
440 - 450		----	-----	----	-----	---	---	0
July 18, 1947 - Flight 15								
Airplane 353 - Traverse 1 Length of traverse 1501.1 sec, 494,397 ft								
0 - 30	19,500	----	-----	----	-----	---	---	0
30 - 40	19,000	----	-----	----	-----	---	---	0
40 - 50		----	-4.6	----	-7.8	---	103	1
50 - 80		----	-----	----	-----	---	---	0
80 - 130	19,500	----	-----	----	-----	---	---	0
130 - 140		----	-4.9	----	-----	---	---	1
140 - 150		3.2	-----	7.3	-----	199	---	1
150 - 160	19,000	----	-----	----	-----	---	---	0
160 - 170		----	-3.5	----	-----	---	---	2
170 - 190		----	-----	----	-----	---	---	0
190 - 200		----	-3.9	----	-----	---	---	2

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 15								
Airplane 353 - Traverse 1 Length of traverse 1501.1 sec, 494,397 ft								
200 - 220	19,000	----	----	----	----	---	---	0
220 - 230	19,500	----	-5.9	----	----	---	---	1
230 - 260		----	----	----	----	---	---	0
260 - 270		----	-3.3	----	----	---	---	1
270 - 350		----	----	----	----	---	---	0
350 - 360		4.3	-5.1	----	----	---	---	2
360 - 510		----	----	----	----	---	---	0
<sup>a</sup> 510 - 520		----	----	----	----	---	---	0
520 - 540		----	----	----	----	---	---	0
<sup>b</sup> 540 - 550		----	----	----	----	---	---	0
550 - 560		----	----	----	----	---	---	0
<sup>a</sup> 560 - 570		2.9	----	----	----	---	---	1
570 - 580	20,000	2.9	----	----	----	---	---	1
<sup>b</sup> 580 - 590		----	----	----	----	---	---	0
590 - 600	19,500	----	----	----	----	---	---	0
600 - 630	19,000	----	----	----	----	---	---	0
630 - 640	19,500	----	----	----	----	---	---	0
640 - 650		3.4	-4.4	----	----	---	---	2
650 - 680		----	----	----	----	---	---	0
680 - 690	19,000	3.7	-5.1	5.6	----	199	---	3
690 - 700		3.0	-2.7	----	----	---	---	2
700 - 710		----	----	----	----	---	---	0
710 - 720	19,500	----	----	----	----	---	---	0
720 - 730		----	-6.2	----	----	---	---	1
<sup>a</sup> 730 - 740		----	-9.8	----	----	---	---	1
740 - 750		----	-6.1	----	----	---	---	2
750 - 760		----	-6.9	----	----	---	---	2
760 - 770	19,000	----	-5.4	----	-11.3	---	139	1
770 - 780		4.1	----	10.4	----	295	---	2
780 - 800		----	----	----	----	---	---	0
800 - 810		6.4	-4.2	----	----	---	---	4
810 - 820		----	-3.9	----	----	---	---	1
820 - 830		----	-5.2	----	----	---	---	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 15					
Airplane 353 - Traverse 1 Length of traverse 1501.1 sec, 494,397 ft					
830 - 840	19,000	3.9	-5.7	----	3
840 - 850	19,500	----	----	----	0
850 - 860		5.2	-5.3	----	2
860 - 870		6.5	----	13.3	1
870 - 880	19,000	----	----	193	0
880 - 890		7.3	----	----	1
890 - 900		----	-8.7	----	1
<sup>b</sup> 900 - 910		----	----	----	0
910 - 1010		----	----	----	0
1010 - 1110	19,500	----	----	----	0
<sup>a</sup> 1110 - 1120		----	----	----	0
1120 - 1130		8.4	-12.4	-8.2	3
1130 - 1140		7.0	-19.4	----	5
1140 - 1150		3.3	-11.5	----	7
1150 - 1160		5.5	-11.1	----	6
1160 - 1180		----	----	----	0
<del>1180</del> - 1190	19,000	1.9	-5.9	----	2
1190 - 1200		3.8	-8.0	-15.1	5
1200 - 1210		----	----	----	0
1210 - 1220		5.3	-2.9	5.9	4
1220 - 1230		----	-10.3	-10.2	1
1230 - 1250		----	----	----	0
1250 - 1260		7.0	-5.5	----	3
1260 - 1270		----	----	----	0
1270 - 1280	19,500	4.6	-4.6	----	2
1280 - 1300		----	----	----	0
1300 - 1310	19,000	5.9	----	10.7	1
1310 - 1320		----	-4.6	-8.3	1
1320 - 1330		----	----	----	0
1330 - 1340	19,500	----	-3.0	----	1
1340 - 1350		----	-6.3	----	1
1350 - 1360		----	-6.3	-10.2	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 18, 1947 - Flight 15					
Airplane 353 - Traverse 1 Length of traverse 1501.1 sec, 494,397 ft					
1360 - 1370	19,500	----	----	---	0
1370 - 1380		3.8	----	---	1
1380 - 1390		----	----	---	0
1390 - 1430	19,000	----	----	---	0
1430 - 1460	19,500	----	----	---	0
1460 - 1490	19,000	----	----	---	0
<sup>b</sup> 1490 - 1500		----	-5.2	---	1
1500 - 1510		----	----	---	0
Airplane 353 - Traverse 2 Length of traverse 224.4 sec, 78,965 ft					
0 - 130	19,500	----	----	---	0
130 - 160	19,000	----	----	---	0
160 - 170		2.9	-7.9	---	4
170 - 180		2.8	-9.4	9.8	2
180 - 230		----	----	---	0
Airplane 327 - Traverse 1 Length of traverse 1491.0 sec, 414,780 ft					
0 - 100	15,000	----	----	---	0
100 - 110		3.0	----	---	2
110 - 220		----	----	---	0
220 - 230		5.8	----	---	1
230 - 510		----	----	---	0
510 - 520		----	-2.3	---	1
520 - 690		----	----	---	0
690 - 700		4.5	-3.7	8.3	3
700 - 710		3.7	-3.8	---	2
710 - 720		3.9	----	---	1
720 - 770		----	----	---	0
770 - 780		4.5	----	11.1	1
780 - 800		----	----	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
July 18, 1947 - Flight 15								
Airplane 327 - Traverse 1								
Length of traverse 1491.0 sec, 414,780 ft								
800 - 810	15,000	----	-2.2	----	-6.4	---	95	1
810 - 820		6.0	----	15.0	----	78	---	1
820 - 830		----	----	----	----	---	---	0
<sup>a</sup> 830 - 840		----	-3.2	----	-6.7	---	83	1
840 - 880		----	----	----	----	---	---	0
880 - 890		----	-11.7	----	----	---	---	1
890 - 900		----	-7.3	----	----	---	---	2
900 - 910		6.8	-8.7	----	-14.0	---	87	5
910 - 920		5.7	-3.4	14.3	----	112	---	2
920 - 930		4.9	----	11.7	----	65	---	1
930 - 940		----	----	----	----	---	---	0
940 - 950		5.3	----	15.9	----	186	---	1
950 - 960		4.7	-12.2	----	-4.6	---	56	5
<sup>b</sup> 960 - 970		----	----	----	----	---	---	0
970 - 1090		----	----	----	----	---	---	0
<sup>a</sup> 1090 - 1100		----	----	----	----	---	---	0
1100 - 1110		5.1	-5.5	----	----	---	---	5
1110 - 1120		5.0	-5.1	----	----	---	---	3
1120 - 1130		4.9	-3.5	----	----	---	---	2
1130 - 1140		6.5	-4.9	15.0	----	184	---	4
1140 - 1150		4.3	-3.6	7.6	----	96	---	2
1150 - 1160		----	-4.9	----	----	---	---	2
1160 - 1170		9.5	-4.3	----	----	---	---	5
1170 - 1180		4.8	----	9.7	----	191	---	1
1180 - 1190		----	----	----	----	---	---	0
1190 - 1200		----	-2.1	----	----	---	---	1
1200 - 1210		----	-3.0	----	----	---	---	1
1210 - 1220		2.9	-5.5	----	----	---	---	2
1220 - 1260		----	----	----	----	---	---	0
1260 - 1270		4.6	-6.8	----	----	---	---	6
1270 - 1280		6.1	-7.1	----	-15.7	---	95	2
1280 - 1290		----	-5.3	----	----	---	---	1

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 18, 1947 - Flight 15								
Airplane 327 - Traverse 1 Length of traverse 1491.0 sec, 414,780 ft								
1290 - 1300	15,000	----	-4.2	----	-7.2	---	53	2
1300 - 1320		----	-----	----	-----	---	---	0
1320 - 1330		----	-5.3	----	-----	---	---	1
1330 - 1340		4.7	-9.2	10.2	-----	59	---	4
1340 - 1380		----	-----	----	-----	---	---	0
1380 - 1390		----	-3.7	----	-----	---	---	1
1390 - 1400		----	-3.1	----	-----	---	---	1
1400 - 1410		----	-----	----	-----	---	---	0
<sup>b</sup> 1410 - 1420		4.9	-----	----	-----	---	---	1
1420 - 1430		----	-----	----	-----	---	---	0
1430 - 1440		3.5	-----	9.7	-----	124	---	1
1440 - 1500		----	-----	----	-----	---	---	0
Airplane 327 - Traverse 2 Length of traverse 219.4 sec, 64,018 ft								
0 - 40	15,000	----	-----	----	-----	---	---	0
<sup>a</sup> 40 - 50		----	-----	----	-----	---	---	0
50 - 80		----	-----	----	-----	---	---	0
80 - 90		----	-3.0	----	-----	---	---	1
90 - 100		4.2	-----	----	-----	---	---	1
100 - 110		13.2	-----	25.2	-----	102	---	2
110 - 120		----	-----	----	-----	---	---	0
120 - 130		----	-4.9	----	-----	---	---	1
130 - 140		----	-3.5	----	-----	---	---	1
140 - 150		----	-----	----	-----	---	---	0
150 - 160		----	-3.4	----	-8.2	---	39	1
160 - 180		----	-----	----	-----	---	---	0
180 - 190		4.3	-4.0	----	-----	---	---	3
190 - 200		5.5	-6.0	----	-----	---	---	5
<sup>b</sup> 200 - 210		4.8	-2.9	----	-3.8	---	89	3
210 - 220		----	-----	----	-----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts			
July 18, 1947 - Flight 15								
Airplane 344 - Traverse 1 Length of traverse 1488.8 sec, 430,144 ft								
0 - 70	10,000	----	-----	----	----	0		
70 - 80		1.8	-----	----	----	1		
80 - 220		----	-----	----	----	0		
220 - 230		----	-----	5.9	----	90	1	
230 - 240		8.1	-6.6	----	-6.7	----	75	2
240 - 250		----	-----	----	-14.5	----	88	1
250 - 260		----	-----	----	-----	----	----	0
260 - 270		2.8	-3.0	----	-----	----	----	2
270 - 280		----	-7.2	----	-3.8	----	75	1
280 - 290		4.0	-----	----	-----	----	----	1
290 - 300		----	-----	----	-----	----	----	0
300 - 310		----	-5.2	----	-3.6	----	228	1
310 - 410		----	-----	----	-----	----	----	0
410 - 420		4.0	-5.1	4.8	-----	100	----	3
420 - 430		2.7	-4.4	----	-----	----	----	4
430 - 440		3.5	-7.3	9.2	-----	134	----	3
440 - 450		----	-4.3	----	-6.0	----	125	2
450 - 460		----	-----	----	-----	----	----	0
460 - 470		----	-5.8	----	-8.1	----	168	1
470 - 480		----	-7.2	----	-----	----	----	1
480 - 490		4.0	-5.8	----	-8.3	----	180	4
490 - 500		1.9	-4.3	----	-----	----	----	2
500 - 510		----	-7.1	----	-----	----	----	3
510 - 520		----	-3.7	----	-----	----	----	1
520 - 710		----	-----	----	-----	----	----	0
710 - 720		----	-4.4	----	-----	----	----	1
720 - 730		----	-----	----	-----	----	----	0
730 - 740		1.7	-5.8	5.3	-----	78	----	3
740 - 750		6.4	-5.8	----	-7.6	----	141	5
750 - 760		3.2	-5.4	----	-----	----	----	3
760 - 770		5.3	-9.9	----	-----	----	----	6
<sup>a</sup> 770 - 780		5.6	-----	7.9	-----	206	----	1
780 - 790		5.6	-6.1	----	-----	----	----	4
790 - 800		5.2	-6.3	----	-9.7	----	38	4

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Concluded

Time interval (sec)	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)		No. of gusts
July 13, 1947 - Flight 15								
Airplane 344 - Traverse 1 Length of traverse 1488.8 sec, 430,144 ft								
800 - 810	10,000	5.5	-6.3	7.9	-----	91	---	5
810 - 820		----	----	----	-----	---	---	0
<sup>b</sup> 820 - 830		----	----	----	-----	---	---	0
830 - 1070		----	----	----	-----	---	---	0
<sup>a</sup> 1070 - 1080		----	----	----	-----	---	---	0
1080 - 1120		----	----	----	-----	---	---	0
1120 - 1130		----	-4.9	----	-5.9	---	168	1
1130 - 1150		----	----	----	-----	---	---	0
1150 - 1160		----	-3.7	----	-3.9	---	47	1
1160 - 1200		----	----	----	-----	---	---	0
1200 - 1210		14.4	----	----	----	-----	---	1
1210 - 1220		8.4	-6.7	----	----	-----	---	6
1220 - 1230		3.8	----	5.4	----	114	---	3
1230 - 1240		3.4	-7.0	----	----	---	---	5
1240 - 1250		----	-5.4	----	----	---	---	2
1250 - 1320	9,500 10,000	----	----	----	-----	---	---	0
<sup>b</sup> 1320 - 1330		----	----	----	-----	---	---	0
1330 - 1370		----	----	----	-----	---	---	0
1370 - 1420		----	----	----	-----	---	---	0
1420 - 1430		----	----	----	-----	---	---	0
1430 - 1440		3.9	-4.9	----	-6.4	---	59	2
1440 - 1490		----	----	----	-----	---	---	0
Airplane 344 - Traverse 2 Length of traverse 217.2 sec, 59,520 ft								
0 - 160	10,000	----	----	----	-----	---	---	0
160 - 170		2.6	----	6.5	-----	42	---	1
170 - 180		----	-5.0	----	-3.2	---	123	2
180 - 190		4.0	----	----	-----	---	---	1
190 - 200		4.6	----	4.2	-----	141	---	2
200 - 210		----	-4.1	----	-----	---	---	1
210 - 220		----	----	----	-----	---	---	0

<sup>a</sup>Cloud entry.<sup>b</sup>Cloud exit.

TABLE II.- SUMMARY OF DRAFT VELOCITY MEASUREMENTS FROM FLIGHTS  
OF P-61C AIRPLANES WITHIN THUNDERSTORMS

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Tra-verse no.	Draft location from start of traverse (sec)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
7-12-47	12	327	25,000	a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
		353	20,000	a <sub>1</sub>				
		354	15,000	1	59.5	70.5	3,292	15.5
					129.5	141.5	3,529	20.3
					362.2	384.0	6,579	-10.3
				a <sub>2</sub>				
				3	28.0	103.0	22,122	-6.1
		344	10,000	1	320.0	366.0	11,440	18.2
				a <sub>2</sub>				
7-14-47	13	351	6,000	a <sub>1</sub>				
				a <sub>2</sub>				
		351	15,000	1	70.4	107.4	11,192	-16.8
		353	11,000	1	352.4	361.2	2,476	-32.6
					941.6	983.0	10,842	23.0
		348	6,000	a <sub>1</sub>				
7-18-47	14	348	14,000	a <sub>2</sub>				
				3	890.0	912.2	6,802	23.8

<sup>a</sup>No draft velocities indicated by records.

TABLE II.- SUMMARY OF DRAFT VELOCITY MEASUREMENTS - Concluded

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Tra-verse no.	Draft location from start of traverse (sec)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
7-18-47	14	353	9,000	1	29.9	35.0	1,475	26.3
				a <sub>2</sub>				
				3	33.7	44.3	3,067	18.9
				a <sub>4</sub>				
				5	222.0	233.6	3,563	-30.0
				a <sub>6</sub>				
	15	344	4,000	b <sub>1</sub>				
				b <sub>2</sub>				
		348	25,000	a <sub>1</sub>				
		353	20,000	1	1126.0	1151.8	8,725	18.8
				a <sub>2</sub>				
		327	15,000	1	1109.7	1132.5	6,571	6.6
					1139.3	1149.4	2,911	-11.6
					a <sub>2</sub>			
		344	10,000	1	782.8	811.2	7,865	13.7

<sup>a</sup>No draft velocities indicated by records.

<sup>b</sup>No drafts due to malfunction of altimeter.



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Gusts - Structure	6.1.2.1
Gusts - Frequency	6.1.2.2
Gusts - Turbulence	6.1.2.3

ABSTRACT

The gust and draft velocities from records of NACA instruments installed in P-61C airplanes participating in thunderstorm flights at Clinton County Army Air Field, Ohio, from July 12, 1947 to July 18, 1947 are presented.